AMENDMENTS TO THE CLAIMS

The following list of claims is intended to replace all prior versions or listings of claims in the application. Please cancel the claims marked canceled, without prejudice to refiling in a continuation or divisional, and amend the claims as follows:

1 – 9 (Canceled)

10. (**New**) A machine comprising:

a computing device for determining an implied volatility of an American option that can be exercised prior to the time when the option expires, wherein said device is configured to:

generate a binomial tree having a plurality of nodes, each node corresponding to a different sub-period of time during which the American option can be exercised prior to the time when the option expires;

compute a value for node vega at each node of the binomial tree for the corresponding sub-period of time;

compute a value for vega for the binomial tree using a function of the values for node vega computed at the nodes; and

compute a value for the implied volatility of the American option using a function of the value of vega computed for the binomial tree.

11. (**New**) The machine of Claim 10, wherein the value for node vega at each node is the exact derivative of the option price with respect to the volatility when the option is not exercised at the sub-period of time corresponding to the node.

12. (**New**) The machine of Claim 10, wherein the value for node vega at each node is the security price of the option when the option is exercised at a sub-period of time corresponding to the node.

13. (**New**) The machine of Claim 12, wherein the security is an index.

14. (**New**) The machine of Claim 10, wherein said computing device is configured to calculate the implied volatility of the American option reiteratively using new values for node vega in each iteration until the computed price of the American option converges to the market price of the American option.

15. (**New**) The machine of Claim 14, wherein said computing device is configured to calculate the new values for node vega in each iteration using the Newton-Raphson method.

16. (**New**) The machine of Claim 10, wherein said computing device is configured to calculate the price of the option at each node at the same time as the computing device calculates node vega at the node.

17. (**New**) A method for determining an implied volatility of an American option that can be exercised prior to the time when the option expires, wherein said method comprises:

generating a binomial tree having a plurality of nodes, each node corresponding to a different sub-period of time during which the American option can be exercised prior to the time when the option expires;

computing a value for node vega at each node of the binomial tree for the corresponding sub-period of time;

computing a value for vega for the binomial tree using a function of the values for node vega computed at the nodes; and

computing a value for the implied volatility of the American option using a function of the value of vega computed for the binomial tree.

18. (**New**) The method of Claim 17, wherein the value for node vega at each node is the exact derivative of the option price with respect to the volatility when the option is not exercised at the sub-period of time corresponding to the node.

19. (**New**) The method of Claim 17, wherein the value for node vega at each node is the security price of the option when the option is exercised at a sub-period of time corresponding to the node.

20. (**New**) The method of Claim 19, wherein the security is an index.

21. (**New**) The method of Claim 17, wherein computing the value of the implied volatility of the American option comprises calculating node vega reiteratively using new values for each iteration until the computed price of the American option converges to the market price of the American option.

22. (**New**) The method of Claim 21, wherein calculating the new values for node vega in each iteration comprises using the Newton-Raphson method.

23. (**New**) The method of Claim 17, wherein node vega and the price of the option are calculated at the same time for each node.

24. (**New**) The machine of claim 10, wherein said machine is configured to compute a value for vega for the binomial tree using a recursive function of the values for node vega computed at the nodes.

25. (**New**) The method of claim 17, wherein said computing of a value for vega for the binomial tree is conducted using a recursive function of the values for node vega computed at the nodes.